I CLAIM:

1. A composition for internally labeling a cell, comprising:

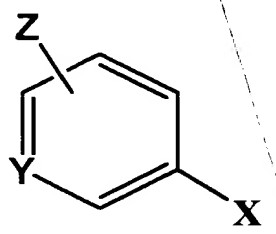
a ligand which specifically binds to a surface antigen of a cell and is internalized by the cell, wherein the ligand is selected from the group consisting of an antibody, a fragment of an antibody, and a synthetic polypeptide;

an oligopeptide which comprises at least one positively charged amino acid residue and at least one D-amino acid residue, wherein the oligopeptide does not comprise two or more contiguous L-amino acids, wherein said oligopeptide is covalently bound to the ligand; and

a label which is covalently bound to the oligopeptide.

2. A composition of claim 1, wherein if the oligopeptide comprises two or more L-amino acids, the L-amino acids are separated from one another by one or more positively charged amino acids.

3. The composition of claim 1, wherein the label is a moiety of formula (II):



(II)

wherein X is a moiety selected from the group consisting of an amino, carboxyl, or sulfhydryl moiety;

wherein Y is selected from the group consisting of C and N; and

wherein Z is selected from the group consisting of F, Br, I, At, and $M(Alk)_3$; wherein M is selected from the group consisting of Si, Sn, and Hg; wherein Alk is selected from the group consisting of methyl, ethyl, propyl, butyl, pentyl, and hexyl.

4. The composition of claim 3, wherein the label is selected from the group consisting of 5-iodo-3-pyridinecarboxylate, 3-iodobenzoate, 3-(tri-*n*-butylstannyl)benzoate, 5-(tri-*n*-butylstannyl)-3-pyridinecarboxylate, and 5-astato-3-pyridinecarboxylate, 3-iodoaniline, 4-iodoaniline, 3-astatoaniline, 4-astatoaniline, 3-tributylstannylaniline, and 4-tributylstannylaniline.

5. The composition of claim 1, wherein the ligand is a monoclonal antibody.

6. The composition of claim 1, wherein the ligand is a ~~chimeric~~ recombinant antibody.

7. The composition of claim 1, wherein the ligand is a humanized antibody.

8. The composition of claim 1, wherein the ligand selectively binds to a tumor cell.

9. The composition of claim 1, wherein the ligand selectively binds to EGFRvIII.

10. The composition of claim 9, wherein the ligand is a monoclonal antibody that specifically binds to to EGFRvIII.

11. The composition of claim 1, wherein the oligopeptide comprises D-Tyr.

12. The composition of claim 11, wherein the oligopeptide additionally comprises D-Arg.

13. The composition of claim 11, wherein the oligopeptide additionally comprises at least three D-Arg residues.

14. The composition of claim 1, wherein the oligopeptide comprises D-Lys.

15. The composition of claim 14, wherein the oligopeptide additionally comprises D-Arg.

16. The composition of claim 14 wherein the oligopeptide additionally comprises at least three D-Arg residues.

17. The composition of claim 1, wherein the label comprises a radionuclide.

18. The composition of claim 8, wherein the label comprises a radionuclide.

19. The composition of claim 17, wherein the radionuclide is an alpha, beta, or gamma emitter.

20. The composition of claim 17, wherein the radionuclide is selected from the group consisting of ^{18}F, ^{75}Br, ^{76}Br, ^{77}Br, ^{123}I, ^{124}I, ^{125}I, ^{131}I, and ^{211}At.

21. The composition of claim 1, wherein the label is fluorescent.

22. A method of incorporating a label into a cell, comprising the step of:

contacting the cell with the composition of claim 1 whereby the label is internalized in the cell.

23. The method of claim 22, wherein the label is fluorescent.

24. The method of claim 22, wherein the label is radioactive.

25. The method of claim 22, further comprising the step of detecting the label.

26. A method of locating tumor cells in a mammal, comprising the steps of:

introducing a diagnostically effective amount of a composition of claim 18 into the body of a mammal which comprises tumor cells;

scanning the body with a scintillation detector; and

generating an image depicting the tumor cells in the body of the mammal.

27. A method of radiotherapy, comprising the step of:

introducing a therapeutically effective amount of a composition of claim 18 into the body of a mammal comprising a tumor, whereby growth of the tumor is diminished.

28. A compound for labeling a ligand which binds to a cell surface antigen, said compound comprising a molecule of formula (I):

$$R_1\text{-NH-(AA)}_n\text{-C-O-}R_2 \qquad \text{(I)}$$

wherein -NH- is an amino end and -C-O- is a carboxyl end of the molecule;

wherein AA is an amino acid residue;

wherein n is an integer having a value of at least 1;

wherein R_1 is H or an amino protecting group;

wherein R_2 is H or a carboxyl protecting group, with the proviso that $R_1 = R_2 = H$ is an unsatisfied condition with said molecule;

wherein R_1 or R_2 is H;

wherein at least one amino acid residue is positively charged;

wherein at least one amino acid residure is a D-amino acid;

wherein the molecule does not comprise two or more contiguous L-amino acids;

wherein at least one amino acid residue is coupled to a label; and

wherein said molecule is sufficient to be coupled to a ligand which specifically binds to a cell surface antigen at only one of said amino end or said carboxyl end.

29. The composition of claim 28, wherein if the molecule comprises two or more L-amino acids, the L-amino acids are separated from one another by one or more positively charged amino acids.

30. The compound of claim 28, wherein R1 is an amino protecting group selected from the group consisting of alkylcarbonyl, arylcarbonyl, and aralkylcarbonyl.

31. The compound of claim 28 wherein R2 is a carboxyl protecting group selected from the group consisting of alkyl, aryl, aralkyl, and alkenyl.

32. The compound of claim 28, wherein at least one amino acid residue is D-Tyr.

33. The compound of claim 32, wherein additionally at least one amino acid residue is D-Arg.

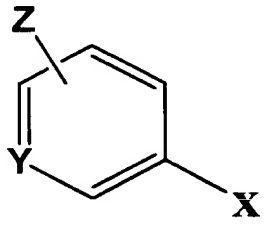
34. The compound of claim 32, wherein additionally at least three amino acid residues are D-Arg.

35. The compound of claim 28, wherein at least one amino acid residue is D-Lys.

36. The compound of claim 35, wherein additionally at least one amino acid residue is D-Arg.

37. The compound of claim 35, wherein additionally at least three amino acid residues are D-Arg.

38. The compound of claim 28, wherein the label is a moiety of formula (II):



(II)

wherein X is a moiety selected from the group consisting of an amino, carboxyl, or sulfhydryl moiety;

wherein Y is selected from the group consisting of C and N; and

wherein Z is selected from the group consisting of F, Br, I, At, and $M(Alk)_3$; wherein M is selected from the group consisting of Si, Sn, and Hg; wherein Alk is selected from the group consisting of methyl, ethyl, propyl, butyl, pentyl, and hexyl.

39. The compound of claim 28, wherein the label is selected from the group consisting of 5-iodo-3-pyridinecarboxylate, 3-iodobenzoate, 3-(tri-*n*-butylstannyl)benzoate, 5-(tri-*n*-butylstannyl)-3-pyridinecarboxylate, and 5-astato-3-pyridinecarboxylate.

40. The compound of claim 28 wherein the label comprises a radionuclide.

41. The compound of claim 40, wherein the radionuclide is an alpha, beta, or gamma emitter.

42. The compound of claim 40, wherein the label comprises at least one radionuclide selected from the group consisting of ^{18}F, ^{75}Br, ^{76}Br, ^{77}Br, ^{123}I, ^{124}I, ^{125}I, ^{131}I, and ^{211}At.

43. The compound of claim 28, wherein the label is fluorescent.